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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/776,053

02/11/2004

Seok-jun Won

SAM-0538

2126

7590

01/25/2005

Anthony P. Onello, Jr.
MILLS & ONELLO LLP
Suite 605
Eleven Beacon Street
Boston, MA 02108

EXAMINER

GARCIA, JOANNIE A

ART UNIT

PAPER NUMBER

2823

DATE MAILED: 01/25/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/776,053	WON ET AL.	
	Examiner	Art Unit	
	Joannie A García	2823	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) ____ is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-6 and 9-11 is/are rejected.
- 7) ☒ Claim(s) 7,8 and 12-20 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|----------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>20040211</u> . | 6) <input type="checkbox"/> Other: ____ |

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Claims 1-20 are objected to because of the following informalities:

Claim 1 recites the limitation "surface of the lower metal electrode" in line 3. There is insufficient antecedent basis for this limitation in the claim.

Claim 12 recites the limitation "surface of the lower metal electrode" in line 3. There is insufficient antecedent basis for this limitation in the claim.

In claim 14, line 8, "a" before "lower metal electrode" should be replaced with --the--.

Claim 14 recites the limitation "top surface of the mold layer" in lines 9-10. There is insufficient antecedent basis for this limitation in the claim.

Claim 14 recites the limitation "remaining sacrificial layer" in line 11. There is insufficient antecedent basis for this limitation in the claim.

Claim 18 recites the limitation "surface of the lower metal electrode" in line 3. There is insufficient antecedent basis for this limitation in the claim.

Appropriate correction is required.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-6, and 9-11, are rejected under 35 U.S.C. 103(a) as being unpatentable over Han et al (U.S. Patent 6,215,143), in combination with Lee et al (U.S. Patent 6,287,910), and the following comments.

Han et al discloses forming a lower electrode 110a of a capacitor (Column 5, lines 15-21), performing a primary wet treatment on a surface of the lower electrode to remove unwanted surface oxides from the surface of the lower electrode (Column 5, lines 48-56), wherein the primary wet treatment is performed using an LAL as an etchant, or a combination of LAL and SC1 (Column 5, lines 52-56), performing a secondary wet treatment on the surface of the lower electrode by using a different etchant than an etchant used in the primary wet treatment to remove unwanted surface organic materials from the surface of the lower electrode (Column 5, lines 57-61), forming a dielectric layer on the lower electrode (Column 5, lines 60-61), and forming an upper electrode on the dielectric layer (Column 5, lines 61-63). Han et al also discloses using H_2SO_4 , and H_2O_2 as etchants (Column 5, lines 33-37).

Han et al discloses forming the lower electrode using polysilicon as the electrode material of the capacitor (Column 4, lines 52-56). Han et al does not teach using titanium nitride as the material for the upper and lower electrodes of the capacitor. Lee et al discloses the use of polysilicon or titanium nitride, among other materials, as lower and upper electrode materials in the manufacture of a capacitor (Column 5, lines 31-37). It would have been within the scope of one of ordinary skill in the art to combine the teachings of Han et al and Lee et al to enable the step of forming lower electrode 110a of Han et al to be performed, by employing either of the materials disclosed by Lee et al.

Han et al discloses the claimed invention except for using the SC1 as the etchant at a temperature ranging from 30 °C to 50 °C. It would have been obvious to one having ordinary skill in the art at the time the invention was made to determine a suitable temperature, since it has been held that where the general conditions of a claim are disclosed in the prior art,

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discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

In addition, the selection of a suitable temperature is obvious, because it is a matter of determining optimum process conditions by routine experimentation with a limited number of species of result effective variables. These claims are prima facie obvious without showing that the claimed ranges achieve unexpected results relative to the prior art range. *In re Woodruff*, 16 USPQ2d 1935, 1937 (Fed. Cir. 1990). See also *In re Huang*, 40 USPQ2d 1685, 1688 (Fed. Cir. 1996)(claimed ranges or a result effective variable, which do not overlap the prior art ranges, are unpatentable unless they produce a new and unexpected result which is different in kind and not merely in degree from the results of the prior art). See also *In re Boesch*, 205 USPQ 215 (CCPA) (discovery of optimum value of result effective variable in known process is ordinarily within skill or art) and *In re Aller*, 105 USPQ 233 (CCPA 1995) (selection of optimum ranges within prior art general conditions is obvious).

Note that the specification contains no disclosure of either the critical nature of the claimed temperatures or any unexpected results arising therefrom. Where patentability is said to be based upon particular chosen temperatures or upon another variable recited in a claim, the Applicant must show that the chosen temperatures are critical. *In re Woodruff*, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990).

Claims 7 and 8 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

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Claims 7, 8, 13-17, 19, and 20, would be allowable if rewritten to overcome the objection(s) set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

Claims 12 and 18 would be allowable if rewritten or amended to overcome the objection(s) set forth in this Office action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joannie García whose telephone number is (571) 272-1861. The examiner can normally be reached on Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Olik Chaudhuri, can be reached on (571) 272-1855. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



JAG
January 21, 2005

GFourson
Primary Examiner



George Fourson
Primary Examiner
Art Unit 2823